

Appl. No. 09/954,475
Amdt. Dated October 9, 2003
Reply to Office Action of July 9, 2003

Attorney Docket No. 81790.0211
Customer No.: 26021

REMARKS/ARGUMENTS

In response to the Office Action dated July 9, 2003, claims 1, 4, 6, 7, 9, and 19 are amended, and claims 3, 5, 8, 15, 16, and 20 are canceled without prejudice or waiver. Claims 32-34 are added. Claims 1, 2, 4, 6, 7, 9-14, 17-19, 21-28, and 32-34 remain in the application. It is not the Applicants' intent to surrender any equivalents because of the amendments or arguments made herein. Reexamination and reconsideration of the application are respectfully requested.

Art-Based Rejections

On pages 2-3 of the Office Action, claims 1-6, 14-18, and 26-28 were rejected under 35 U.S.C. § 102(b) as being anticipated by Nitsuta et al., JP 62026653.

On pages 3-5 of the Office Action, claims 8 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nitsuta et al., JP 62026653 in view of Staskus et al, USPN 5,923,692, claims 7, 9-13, 19, and 22-25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nitsuta et al., JP 62026653 in view of Kawamura et al, USPN 6,452,880, and claim 21 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Nitsuta et al., JP 62026653 in view of admitted prior art.

The Applicant respectfully traverses the rejections in light of the clarifying amendments above and the arguments below.

The Nitsuta Reference

The Nitsuta reference discloses a light detector. A supporting body 22 as the thermal stress relaxing material composed of the rectangular parallelopiped shaped silicon fixed by a semiconductor laser chip 15 inclines, as the shaft, the line to

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penetrate vertically the bonding surface of the semiconductor laser chip 15. See Constitution.

The Staskus Reference

The Staskus reference is cited as disclosing a heatsink in FIG. 1A.

The Kawamura Reference

The Kawamura reference discloses an optical pickup apparatus having a 650 nm light emitting device and a 780 nm light emitting device (see Col. 6, lines 53-54).

The Admitted Prior Art

The admitted prior art discloses a diffraction grating, collimator lens, half mirror, objective lens, and a light receive element.

The Claims are Patentable over the Cited Reference

The claims of the present invention describe a semiconductor laser device. A device in accordance with the present invention comprises a semiconductor laser chip having a first surface of which shape is approximately rectangular or square, and having an emission facet for emitting a laser beam, and a sub-mount having a first surface on which the semiconductor laser chip is provided, and at least one second surface vertical to the first surface, the first surface of the sub-mount having parallel first edges and second edges between the first edges, the first edges being parallel to the edges of the first surface of the semiconductor laser chip, at least one of the second edges corresponding to the emission facet being inclined at an angle of 3 to 30 degrees to the emission facet, wherein the one second surface including at

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least one of the second edges corresponding to the emission facet inclines along with the at least one of the second edges and reflects an incident light orthogonal to the emission facet of the semiconductor laser chip to a different direction in accordance with the angle of the second surface.

Claims 1, 9, and 21

The cited references do not teach nor suggest the limitations of the claims of the present invention. Specifically, the cited references does not teach nor suggest the limitation of the first edges of the sub-mount being parallel to the edges of the first surface of the semiconductor laser chip as recited in the claims of the present invention.

In claims 1 and 9, the first surface of a semiconductor laser chip is substantially rectangular or square. The first surface of a sub-mount has edges which are in parallel to those of the first surface of the semiconductor laser chip and at least one second edge which is inclined at an angle of 3 to 30 degrees to an emission facet of the first semiconductor laser chip. One of the second surfaces of the sub-mount, which includes at least one of the second edges, is inclined along with at least one of the second edges, and reflects an incident light orthogonal to the emission facet to a different direction. According to this structure, when a semiconductor laser chip is mounted on the sub-mount, it is only necessary to arrange the semiconductor laser chip in such a manner that the edges of it are in parallel to the edges of the first surface of the sub-mount. Thus, the semiconductor laser chip can be easily arranged on the sub-mount. By using a positioning pin in this state, it becomes possible to position the emission surface of the semiconductor chip and the at least one of the second surfaces of the sub-mount with high accuracy. Therefore, positional accuracy of the semiconductor laser chip on the sub-mount can be enhanced.

In claim 21, the semiconductor laser device comprises a semiconductor laser chip having an emission facet for emitting a laser beam, and a sub-mount having a first surface on which the semiconductor laser chip is provided, and at least one second surface vertical to the first surface, wherein the one second surface, which is arranged in line with the emission facet of the semiconductor chip, is inclined at an angle of 3 to 30 degrees to the emission facet.

In contrast, in Nitsuta, a supporting body 22 in FIGS. 1 and 3 has a rectangular surface on which a semiconductor laser chip 15 is provided. In Nitsuta, inclination is held at the photodetecting surface 23 of the supporting body 22 to an end face of the semiconductor laser chip 15. Further, inclination is held at the semiconductor laser chip 15 to the supporting body 22. It is difficult to incline the semiconductor laser chip 15 to the supporting body 22 at a given angle, while setting the relative position between the semiconductor laser chip 15 and supporting body 22 constant. In Nitsuta, even if a positioning pin is used, it is difficult to position the semiconductor laser chip 15 on the supporting body 22 with high accuracy. Accordingly, it is difficult to improve the positional accuracy of the semiconductor laser chip 15 and the supporting body 22.

In FIG. 2 of Nitsuta, the edges of the supporting body 22 and those of the semiconductor laser chip 15 are parallel to each other. However, the positional relationship between the emission facet of the semiconductor laser chip 15 and the photodetecting surface 23 of the supporting body 22 is different from that of claim 1 of the present application. In the structure of FIG. 2, in order to form the photodetecting surface 23, the supporting body 22 needs to be cut obliquely with respect to the width direction of the supporting body 22, which complicates the manufacturing steps.

As such, Nitsuta does not teach nor suggest the limitations of the claims of the present invention, namely, Nitsuta does not teach or suggest the limitation of first edges of the sub-mount being parallel to the edges of the first surface of the

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semiconductor laser chip as recited in the claims of the present invention, nor does Nitsuta teach or suggest the limitation of the one second surface arranged in line with the emission facet of the semiconductor chip as recited in claim 21 of the present invention.

The ancillary Staskus, Kawamura, and admitted prior art references do not remedy the deficiencies of the primary Nitsuta reference, namely, the ancillary Staskus, Kawamura, and admitted prior art references do not teach nor suggest the limitation of first edges of the sub-mount being parallel to the edges of the first surface of the semiconductor laser chip as recited in the claims of the present invention, nor do the ancillary references teach the limitation of the one second surface arranged in line with the emission facet of the semiconductor chip.

Thus, it is submitted that independent claims 1, 9, and 21 are patentable over the cited references. Claims 2, 4, 6, 7, 10-14, 17, 18, 19, 22-28, and 32-34 are also patentable over the cited references, not only because they contain all of the limitations of the independent claims, but because these claims also describe additional novel elements and features that are not described in the prior art. Silence with respect to the remainder of the arguments should not be taken to mean that the Applicant agrees with the arguments presented in the Office Action.

Conclusion

It is submitted that this application is now in good order for allowance and such allowance is respectfully solicited. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at telephone number (213) 337-6742 to discuss the steps necessary for placing the application in condition for allowance.

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If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,

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